

What is claimed is:

1. A control apparatus comprising:

an operator member displaceable, in response to operation by a human operator, relative to at least one displacement axis;

a detection section that detects an operating state of said operator member;

a supply section that supplies model operation information indicative of an operating state to be taken by said operator member;

a reactive force information generation section that generates reactive force information corresponding to a difference between the operating state detected by said detection section and the operating state indicated by the model operation information; and

a reactive force impartment section that imparts said operator member with a reactive force corresponding to the reactive force information generated by said reactive force information generation section.

2. A control apparatus as claimed in claim 1 wherein said operator member is displaceable relative to a plurality of displacement axes,

said detection section detects, separately for each of the displacement axes, displacement of said operator member responsive to the operation by the human operator,

said supply section supplies, for each of the displacement axes, model operation information indicative of an operating state to be taken by said operator member for the displacement axis,

said reactive force information generation section generates, for each of the displacement axes, reactive force information corresponding to a

difference between the operating state detected for the displacement axis by said detection section and the operating state indicated by the model operation information supplied for the displacement axis, and

said reactive force impartment section imparts, for each of the displacement axes, said operator member with a reactive force corresponding to the reactive force information generated for the displacement axis by said reactive force information generation section.

3. A control apparatus as claimed in claim 2 wherein each of the displacement axes is associated with any of a plurality of tone factors, and

which further comprises a tone signal generation section that generates a tone signal by setting or controlling the plurality of tone factors in accordance with detection data indicative of the operating states detected by said detection section for individual ones of the displacement axes.

4. A control apparatus as claimed in claim 1 wherein said reactive force impartment section includes an electric motor that is driven so as to impart said operator member with a reactive force corresponding to the reactive force information generated by said reactive force information generation section.

5. A control apparatus as claimed in claim 2 wherein at least one of the displacement axes is a linear-displacement axis along which said operator member is displaceable linearly.

6. A control apparatus as claimed in claim 2 wherein at least one of the displacement axes is a pivotal-displacement axis about which said operator member is pivotally displaceable.

7. A control apparatus as claimed in claim 1 wherein said detection section detects, as the operating state of said operator member, at least any one of physical variables of an operating position, operating velocity and operating acceleration, and

wherein said supply section supplies model operation information corresponding to the physical variable detected by said detection section.

8. A control apparatus as claimed in claim 1 which is portable.

9. A control apparatus comprising:

an operator member pivotable, in response to operation by a human operator, about a plurality of axes;

a plurality of detection sections provided in corresponding relation to the plurality of axes, each of said detection sections detecting an operating state, for the corresponding axis, of said operator member to thereby output a detection signal corresponding to the detected operating state;

a reactive force information generation section that generates separate reactive force information to be applied to individual ones of the axes on the basis of the detection signals outputted by said plurality of detection section; and

a reactive force impartment section that imparts the individual axes with separate reactive forces on the basis of the reactive force information generated for the individual axes by said reactive force information generation section,

wherein a plurality of control signals are provided on the basis of the detection signals outputted from individual ones of said detection sections.

10. A control apparatus as claimed in claim 9 which further comprises a tone control section that controls a tone on the basis of the plurality of control signals.